Comments

on

Proposed Adoption of Regulations Permitting Statewide Residential Use of Polyvinyl Chloride (PVC) and Acrylonitrile Butadiene Styrene (ABS) Plastic Drain, Waste and Vent (DWV) Pipe In Buildings More Than Two Stories in Height

Amending Sections 701.1.2.2, 903.1.2.2, 1101.3.1, 1101.3.3 and 1102.1.2 of the California Plumbing Code

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Comments

The California Department of Housing and Community Development ("HCD") has proposed adoption of regulations that would modify Sections 701.1.2.2, 903.1.2.2, 1101.3.1, 1101.3.3, and 1102.1.2 of the California Plumbing Code ("CPC") to permit statewide unconditional use of polyvinyl chloride ("PVC") and acrylonitrile butadiene styrene ("ABS") plastic drain, waste and vent ("DWV") pipe within residential structures more than two stories in height (hereafter referred to as "Project").

Under the current CPC regulations, HCD restricts the use of PVC and ABS DWV pipe to residential buildings no more than two stories in height. The removal of the two-story restriction is likely to increase the amount of PVC and ABS pipe installed in new residential construction and their use for re-pipings (*i.e.*, replacing DWV piping in existing residences) as a direct result of builder choice over commonly used cast iron or copper pipe. The cleaners and cements used to join PVC and ABS pipes contain solvents that are volatile organic compounds[1] ("VOCs") which evaporate during application. VOCs, together with nitrogen oxides ("NOx"), are the main reactants in the atmospheric photochemistry that produces ozone in the troposphere, also referred to as photochemical smog.

As discussed in my comments below, removal of the restrictions on the use of PVC and ABS pipe may result in significant direct and cumulative air quality impacts, both statewide and within specific air basins. Such impacts should be quantified and evaluated in more detail in an Environmental Impact Report ("EIR") prior to the consideration of this Project for approval.

I. The Proposed Project Would Increase Statewide Use of PVC and ABS Solvents and therefore Increase Emissions of VOCs

Sections of PVC and ABS pipe are joined using fittings or connectors. The pipe is chemically fused to the connector using a process called "solvent welding" or "cementing." This process uses chemicals—cleaners and cements—which are applied to the end of the pipe and the inside of the fitting socket. The pipe ends and fittings are first cleaned and then cement is applied to bond the pipe and fitting. The cleaners and cements used to join PVC and ABS pipe contain high concentrations of solvents that are VOCs. These VOCs are evaporated during the transfer, drying surface preparation, and cleanup, resulting in VOC emissions. The VOCs are

[1] The terms "volatile organic compounds" and "reactive organic gases ("ROGs")" are used interchangeably for purposes of this comment letter.

converted into ozone and fine particulate matter in the atmosphere, causing or contributing to violations of ambient air quality standards and attendant health effects.

II. VOC Emissions Would Cause Violations or Contribute to Existing Violations of Ozone Ambient Air Quality Standards

The U.S. EPA and California have both set ambient air quality standards on ozone to protect public health and welfare. These standards are exceeded throughout much of the State. (*See*, national 1-hour and 8-hour ozone standards area designations.[2]) On April 15, 2004, U.S. EPA designated all or parts of 35 counties in California as non-attainment for the new federal 8-hour ozone ambient air quality standard, effective June 15, 2005. (CARB Initial Statement[3], p. 4.) The South Coast air basin, which experiences the highest growth of the residential housing market, has the highest concentrations of ozone in the ambient air in the United States, followed by the San Joaquin Valley air basin. The South Coast air basin is classified as extreme non-attainment area under both the national 1-hour and 8-hour ozone standards and the state ozone standard.[4] Any increase in ozone concentrations in an area that significantly exceeds ambient air quality standards for ozone should be considered significant.

The large increase in ozone precursors that would potentially be caused by the expanded approval of PVC and ABS DWV pipe in the South Coast and other areas that currently experience violations of state or federal ozone ambient air quality standards would be a significant impact. These VOC emissions would cause violations and/or contribute to existing violations of ozone ambient air quality standards throughout most of California.

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[2] California Air Resources Board, 2004 Area Designations for State Ambient Air Quality Standards, Ozone, October 18, 2004, *see* http://www.arb.ca.gov/desig/adm/s_classif.pdf; United States Environmental Protection Agency, Area Designations for National Ambient Air Quality Standards, 1-Hour Ozone, January 2006, *see* http://www.arb.ca.gov/desig/adm/fed_1hr_class.pdf; Area Designations for National Ambient Air Quality Standards, 8-Hour Ozone, January 2006, *see* http://www.arb.ca.gov/desig/adm/fed_8hr_desig.pdf;

[3] California Air Resources Board, Initial Statement of Reasons for Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measures for Para-dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products, Volume I: Executive Summary, 2004.

[4] Two air basins in California are classified as "extreme" ozone non-attainment areas for the federal 1-hour ozone standard, the South Coast air basin and San Joaquin Valley air basin. Extreme non-attainment is a formal classification under the Clean Air Act for areas that have the highest 1-hour ozone levels.

Ozone is continuously measured at 175 sites in California. The California Air Resources Board ("CARB")'s analysis of these ozone monitoring data indicates that many areas currently exceed ambient air quality standards:

> "The highest number of exceedance days for both the State and federal 1-hour standards occurred in the San Joaquin Valley Air Basin and the South Coast Air Basin. Both areas had more than 115 State standard exceedance days and 31 or more federal standard exceedance days during each of the three years from 2001 through 2003. The Sacramento Metro Area, Mojave Desert Air Basin, and Salton Sea Air Basin all averaged more than 50 State standard exceedance days and averaged 6 or more federal standard exceedance days during 2001 through 2003. The remaining five areas (Mountain Counties Air Basin, San Diego Air Basin, San Francisco Bay Area Air Basin, South Central Coast Air Basin, and the Upper Sacramento Valley) averaged from 12 to 45 State standard exceedance days." (CARB Review 2005[5], pp. 1-3 and Chapter 7, Figures 7-2 and 7-3.)

These ozone monitoring data also indicate that the highest concentrations of ozone occur throughout the State during the July to September period which coincides with the peak construction period. (*Id.*, Figures 7-4 and 7-5.) Thus, the highest VOC emissions occur when the ambient air quality is already severely compromised. Most of these violations occur in those regions experiencing the highest growth of the residential housing market and hence the majority of new construction. The future increases that would be authorized by this Project would cause violations and/or contribute to existing violations of ozone air quality standards. These impacts are significant on a statewide, air district wide, and cumulative basis, as discussed in the comments below.

Given the widespread violation of ozone standards, the regional nature of the ozone problem, the failure of much of the State to meet ozone standards, and the public health threat presented by high ozone concentrations in ambient air, any increase in ozone precursors that would contribute substantially to an existing exceedance of ozone standards must be considered significant under CEQA. Thus, the HCD must prepare an EIR for the Project to fully analyze, disclose to the public, and consider adequate mitigation measures to address this important public health problem.

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[5] California Air Resources Board, Review of the California Ambient Air Quality Standard for Ozone, Staff Report, Initial Statement of Reasons for Proposed Rulemaking, March 11, 2005; http://www.arb.ca.gov/research/aaqs/ozone-rs/ozone-final/ozone-final.htm.

III. Thresholds of Significance

The potential impact of this project on air quality should be evaluated using local air district's quantitative CEQA thresholds of significance for construction and operational impacts on air quality. The appropriate threshold would be the operational rather than construction threshold of significance. In fact, the California Air Resources Board ("CARB") advises evaluating plastic pipe solvent emissions against both the operational and construction thresholds of significance to give "reasonable but conservative estimates of impacts." (Yee 05/11/2006[6]; Exhibit 1.)

Operational thresholds of significance are the more appropriate thresholds because the Project in this case is not an individual residential development project but rather the change in the plumbing code itself. A "project" under CEQA refers to the whole of the activity being approved, even if the activities that result from the project may be subject to multiple separate discretionary approvals by government agencies. The term "project" does not mean each separate governmental approval. (CEQA Guidelines section 15378 (c).)

This code change will result in a large number of installations on any given day and would result in continual emissions of VOCs from many individual concurrent projects. VOC emissions would occur continually from PVC and ABS installation throughout the state, day after day, over an infinite number of years. Because the Project would result in ongoing and continual emissions with resultant adverse impacts on the State's air quality, it is appropriate to evaluate these emissions against local air districts' operational thresholds of significance.

A building code sets forth specific conditions for individual but recurring activities. As such it is comparable to regulations issued by local air districts and their amendments. Such air district regulations and their amendments of rules are routinely evaluated against the respective local air district's operational CEQA thresholds of significance. In a comparable action to the Project, the South Coast Air Quality Management District ("SCAQMD") evaluated the potential air quality impacts resulting from relaxing limits on the VOC content allowed in primers and sealers used to weld chlorinated polyvinyl chloride ("CPVC") pipes under SCAQMD Rule 1168. (SCAQMD 12/2004.[7]) This action is very similar to the Project in that it involves a regulation that that would increase VOC emissions from the use of plastic pipe solvents, increases that would occur during project construction from a large number of small sources spread throughout the district. The SCAQMD

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[6] Judy Yee, California Air Resources Board, Email to Robin Gilb, California Department of Housing and Community Development, Re: Thresholds of Significance for VOC Impacts, May 11, 2006.

[7] South Coast Air Quality Management District, Final Subsequent Environmental Assessment for: Proposed Amended Rule 1168 – Adhesive and Sealant Applications, December 22, 2004.

concluded that the resulting increase in VOC emissions from the change to Rule 1168, reductions that would be foregone by the rulemaking, was significant because they exceeded the District's operational threshold of significance for VOC emissions of 55 lbs / day.

Other similar examples include the CEQA Initial Study for proposed amendments to the Bay Area Air Quality Management District ("BAAQMD") Regulation 8, Rule 43: Surface Coating of Marine Vessels (BAAQMD 2001 / 03[8]), the SCAQMD's environmental assessment of an amendment to Rule 1157 – PM10 Emission Reductions from Aggregate and Related Operations (SCAQMD 2006 / 07[9]), or the SCAQMD's environmental assessment for the proposed fleet vehicle rules and related rule amendments (SCAQMD 2006 / 07[10]).

In the case at hand, I have evaluated the proposed Project's impacts on the air quality basin under the jurisdiction of the SCAQMD. The air basin under the jurisdiction of SCAQMD is designated extreme non-attainment for ozone under both the California and national ambient air quality standards. The SCAQMD's CEQA significance threshold for operational VOC emissions is 55 lbs / day. The SCAQMD's CEQA significance threshold for VOC emissions from construction activities is 75 lbs / day.

IV. Estimated Increase in Emissions Due to Project

For this preliminary analysis, I have estimated the potential increase in emissions due to the Project both statewide and within the jurisdiction of the SCAQMD. An EIR, however, must be prepared to evaluate the Project's impacts on the air quality in each of the local air quality management districts throughout the state, as well as statewide impacts.

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[8] Bay Area Air Quality Management District, CEQA Initial Study for Proposed Amendments to Bay Area Air Quality Management District Regulation 8, Rule 43: Surface Coating of Marine Vessels, March 6, 2001; http://www.baaqmd.gov/pln/ruledev/8-43/2001/0843_ceqa1_030601.pdf, accessed August 31, 2006.

[9] South Coast Air Quality Management District, Amend Rule 1157 — PM10 Emission Reductions and Related Operations, July 7, 2006; http://www.aqmd.gov/hb/2006/July/060735a.html, accessed August 31, 2006.

[10] South Coast Air Quality Management District, Final Program Environmental Assessment for: Proposed Fleet Vehicle Rules and Related Rule Amendments, June 5, 2000, SCAQMD No. 000307DWS; http://www.aqmd.gov/ceqa/documents/2000/aqmd/finalEA/1190/1190FEA.html, accessed August 31, 2006, accessed September 6, 2006.

In order to estimate the potential increase in emissions due to the Project, the number of new units plumbed with PVC or ABS as a result of the proposed code change must be estimated and multiplied by the estimated VOC emissions per unit.

IV.A Estimated Number of New Units Plumbed With PVC or ABS as a Result of the Proposed Code Change

HCD's public notice for the proposed project fails to disclose or evaluate the number of new or replaced DWV systems that may be plumbed with PVC or ABS as a result of the proposed code change.[11] CEQA places the burden of environmental investigation on government agencies and project proponents rather than the public. As a result, an agency is not "allowed to hide behind its own failure to gather relevant data." (*Gentry v. City of Murietta* (1995) 36 Cal.App.4th 1359.) Because HCD has failed to investigate and disclose the potential scope of new ABS and PVC DWV installations, a fair argument may be based on the limited facts in the record. (*Id.*)

The proposed regulations would expand the approved installation of PVC or ABS DWV pipe to residential buildings over two stories in height. The number of new units that may be affected by these regulations can be roughly estimated by using U.S. Census Bureau data. According to U.S. Census Bureau data, California authorized 47,629 new units in structures with 3 or more units in 2005.[12] The U.S. Census Bureau also provides a break down of these data by county, allowing to estimate the potential new installations by local air district or air basin.

The jurisdiction of the SCAQMD includes all or portions of Los Angeles County, Orange County, Riverside County and San Bernardino County. According to U.S. Census data, 18,380 new units in structures with 3 or more units were authorized in the counties under the jurisdiction of the SCAQMD.[13]

Thus, for purposes of my preliminary analysis, I assumed that 47,629 new units would be plumbed statewide with PVC or ABS as a result of the proposed code change ("Project units"). I further assumed that 18,380 Project units would be plumbed with PVC or ABS within the jurisdiction of the SCAQMD as a result of the proposed code change.

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[11] Combined Notice of Proposed Action 2006 Annual Code Adoption Cycle, Tracks 8 & 10; http://www.bsc.ca.gov/prpsd_chngs/pc_06_comment.html, accessed October 17, 2006.

[12] U.S. Census Bureau, Table 2au, New Privately Owned Housing Units Authorized Unadjusted Units for Regions, Divisions, and States, Annual 2005; http://www.census.gov/const/C40/Table2/tb2u2005.txt, accessed October 1, 2006.

[13] U.S. Census Bureau, 2005 Building Permits; http://censtats.census.gov/bldg/bldgprmt.shtml, accessed October 1, 2006.

For purposes of my preliminary analysis, I have assumed that all structures with 3 or more units are in buildings of more than two stories. I have also assumed that all of these units will be built within the jurisdiction of the SCAQMD. These assumptions are reasonable for several reasons.

First, the U.S. Census data counts condominiums, cooperatives and townhouses as single family structures (rather than multi-unit structures) where units are: (a) separated from adjoining units by a wall that extends from ground to roof; (b) are side-by-side with no other units above or below; (c) have separate heating systems; and (d) have separate utility meters.[14] Therefore many multi-unit developments less than two stories in height are not included in these data.

Second, the SCAQMD contains the most densely urbanized areas of the counties within its jurisdiction making it likely that the majority of multi-story, multi-unit buildings constructed in these counties will occur within the jurisdiction of the SCAQMD.

Third, the U.S. Census data does not include a large number of buildings under HCD jurisdiction that would also be allowed to install PVC and ABS DWV pipe under the proposed regulations.[15] These buildings include: hotels, motels, lodging houses, dormitories, shelters, congregate residences, employee housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities, including accessory buildings and facilities.[16] Reliance on data for new buildings with three or more units also does not account for one- or two-unit buildings that are greater than two stories in height.

Hotel and motel rooms alone may account for a significant number of potential new PVC and ABS DWV pipe installations. Lodging Econometrics, the leading industry authority for hotel real estate statistics, reports that Los Angeles alone expects to construct 7,015 additional hotel rooms in 2006.[17] In comparison, U.S. Census data show that Los Angeles County has only authorized 10,357 new units in residential structures with three or more units.[18] Thus, new hotel rooms

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[14] U.S. Census Bureau, Frequently Asked Questions for Building Permits Survey Respondents, http://www.census.gov/const/www/permitsfaq.html, accessed October 8, 2006.

[15] *Id*.

[16] California Plumbing Code section 101.11.8.1.

[17] Lodging Econometrics, U.S. Development Pipeline at 2Q06 (July 18, 2006); http://www.lodgingintelligence.com/LE06Templates/2QpipeInd.htm, accessed October 8, 2006.

[18] U.S. Census Bureau, 2005 Building Permits; http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.pl, accessed October 1, 2006.

alone could account for a 70% increase in PVC and ABS installations. These installations are not included in my preliminary calculations.

Fourth, reliance on data for new buildings fails to account for the potentially significant amount of partial or wholesale DWV re-pipings in buildings of greater than two stories. This number is also likely significant. The California Building Industry Association has estimated that 100,000 potable water re-pipes are required per year.[19] A similar estimate must be obtained by HCD for potential DWV re-pipes.

Taking into account that numerous buildings and re-pipes are not included in the U.S. Census data, my assumption that 47,629 new Project units will be built each year in California and 18,380 new Project units will be built in the jurisdiction of the SCAQMD likely significantly underestimates the actual number of new units potentially plumbed with PVC or ABS as a result of the proposed code change. An EIR must be prepared to investigate and disclose a more accurate estimate of the scope of potential new PVC and ABS DWV installations.

To adjust for the large number of buildings and re-pipes that are not included in the U.S. Census data for structures with three or more units, I have assumed that 100 percent of all units would be plumbed with PVC or ABS given the opportunity. Industry data suggests that the actual number would likely be between 90 to 95 percent. Data obtained from the an independent market research group, the Freedonia Group, indicates that over 90 percent of DWV pipe sold in 2004 was plastic pipe.[20] The Freedonia Group estimates that this percentage will rise to nearly 94 percent by 2014.

Moreover, the proposed Project would make it a mandatory ministerial duty for all local building officials to approve the use of PVC or ABS DWV pipe in all residential developments and re-pipings since the local building officials must comply with the CPC. The State has fully preempted the field of building standards and building regulation in order to establish a uniform set of minimum statewide building standards. (*Baum Electric Company v. City of Huntington Beach* (1973) 33 Cal.App.3d 573, 581.) The courts have held that ensuring "protection of public health and safety" is the "paramount policy" underlying State preemption and the

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[19] California Department of Housing and Community Development, Draft Environmental Impact Report, Adoption of Regulations Permitting Statewide Residential Use of Chlorinated Polyvinylchloride ("CPVC") Plastic Plumbing Pipe Without First Making a Finding of Potential Premature Metallic Pipe Failure Due to Local Water or Soil Conditions, July 2006, SCH #2006012044, at p. 3.

[20] The Freedonia Group, "Drain, Waste & Vent – Plastic & Competitive Pipe to 2009"; http://freedonia.ecnext.com/free-scripts/html_concat_view.pl?items=0285-294550; accessed October 2, 2006.

requirement that local governments comply with State building standards. (*Ibid.*) Thus, either PVC or ABS DWV pipe could potentially result in 100 percent penetration of the DWV pipe market in California since local building officials will be divested of authority to deny approval to these materials.

PVC is by far the most prolific DWV material. More than 50 times more PVC pipe was sold in 2001 than ABS pipe.[21] Nonetheless, anecdotal evidence suggests that ABS is used for DWV pipe much more frequently in California than nationally. For purposes of my preliminary analysis, I have calculated estimated air quality impacts assuming: (1) 100% PVC use; (2) 100% ABS use; (3) 70% PVC use and 30% ABS use; (4) 50% PVC use and 50% ABS use and (5) 30% PVC use and 70% ABS use.

IV.B Estimated VOC Emissions per Unit

Potential VOC emissions per unit can be estimated by calculating the number and size of plastic pipe joints that will be required in constructing a typical unit. Each joint must be joined by the use of PVC or ABS solvents. The amount of solvent used per joint can be estimated by industry tools such as the E-Z Weld calculator. The amount of VOC per ounce per liter of solvent can be calculated by the VOC limits mandated in the proposed 2007 plumbing code provisions. VOC emissions per unit are then calculated by multiplying the amount of PVC or ABS solvent that will be applied per average unit by the VOC content of the solvent.

IV.B.1 Number of Joints per Unit

The typical unit in a new multi-story building in California has between 1½ and 2½ baths.[22] A 2 ½ bath unit in a multi-story building constructed with plastic DWV piping will contain: 8 joints for 4-inch pipe; 30 joints for 3-inch pipe; and 72 joints for 2-inch pipe.[23] A 1½ bath unit in a multi-story building constructed with plastic DWV piping will contain: 6 joints for 4-inch pipe; 19 joints for 3-inch pipe; and 55 joints for 2-inch pipe.[24]

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[21] Christopher Musso, Beating the System: Accelerating Commercialization of New Materials (2004) at p. 176; http://esd.mit.edu/people/dissertations/musso_christopher.pdf; accessed October 9, 2006.

[22] *See* Exhibit 2, Declaration of Casey J. Sondgeroth, October 18, 2006.

[23] *See* Exhibit 3, plumbing schematics provided by Plumbers & Steamfitters Union Local 159.

[24] *Id*.

IV.B.2 Amount of Primer and Cement per Unit

In order to calculate the amount of PVC or ABS solvent that will be applied per average unit, I estimated the number of joints per unit and entered this value into the industry calculator known as the E-Z Weld Calculator.[25]

According to the E-Z Weld Calculator, a 2½ bath unit in a multi-story building constructed with plastic DWV piping would require approximately 2.2 quarts (or 2.1 liters) of cement, not including any solvent needed to clean the pipe.[26] A 1½ bath unit in a multi-story building constructed with plastic DWV piping will need approximately 1.6 quarts (or 1.5 liters) of cement, not including any solvent needed to clean the pipe.[27] The average between these calculations is 1.9 quarts (or 1.8 liters).

The E-Z Weld calculator states that the amount of pipe cleaner needed will be approximately one third the amount of cement (or an additional 33% of VOC-containing solvents). For the purposes of my preliminary calculations, I have not included the use of cleaners in my calculations. Such calculations, however, must be included in an EIR on this Project in order to disclose the full scope of potential air quality impacts.

IV.C VOC Content of Primers and Cements

The proposed 2007 California Plumbing Code provisions require the use of low-VOC PVC and ABS cements.[28] The proposed regulations require the use of PVC cements that contain no more than 510 g/l of VOCs and the use of ABS cements that contain no more than 325 g/l of VOCs.

IV.D VOC Emission Factor per Housing Unit

I calculated the VOC emission factor per housing unit by multiplying the number of liters of cement per unit by the VOC content of the PVC or ABS cements. Table 1 summarizes the resulting VOC emissions per unit.

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[25] E-Z Weld Calculator; http://members.aol.com/ezweld/ezcalc.html.

[26] *See* Exhibit 4; Calculations from E-Z Weld Calculator; http://members.aol.com/ezweld/ezcalc.html.

[27] *Id*.

[28] HCD, Proposed Amendments to 2007 CPC, Sections 214 & 316.1.6.

Table 1: VOC Emissions per Housing Unit*

Type of Pipe	2½ Bath Units	1½ Bath Units	Average Unit
PVC	1,041 grams/unit or 2.3 lbs/unit	750 grams/unit or 1.7 lbs/unit	895 grams/unit or 2.0 lbs/unit
ABS	6637 grams/unit or 1.5 lbs/unit	478 grams/unit or 1.1 lbs/unit	570 grams/unit or 1.3 lbs/unit

* lbs/unit calculated from (grams/unit) / (453.4 grams/lb)

IV.E Statewide Annual Project VOC Emissions

I calculated annual Project VOC emissions by multiplying the estimated amount of VOC per unit by the estimated number of new units in residential buildings of three or more units. As discussed earlier, while the new unit estimate may include some residential buildings of three or more units that are two stories or less, it fails to include re-pipes, hotels and one and two unit residences with more than two stories. The Project unit estimate I have employed may, thus, significantly understate the actual VOC emissions per year that may result from the Project.

Table 2: State Annual Project VOC Emissions (lbs/year)

Type of Pipe	2½ Bath Units	1½ Bath Units	Average Unit
PVC	109,311	78,738	94,024
ABS	69,659	50,176	59,917
70% PVC / 30% ABS	97,415	70,169	83,792
50% PVC / 50% ABS	89,485	64,457	76,971
30% PVC / 70% ABS	81,554	58,745	70,149

IV.F SCAQMD Annual Project VOC Emissions

I calculated annual SCAQMD VOC Emissions by multiplying the total number of pounds of VOCs that the Project would potentially emit statewide (as determined in Table 2 by the percentage of Project units located in the jurisdiction of the SCAQMD. The 18,380 SCAQMD units represent about 39%[29] of the 47,629 total Project units in the state. Accordingly, the number of pounds of Project VOCs emitted within the SCAQMD will equal about 39% of the total pounds of Project VOCs emitted within the state. Table 3 summarizes estimated annual VOC emissions in the SCAQMD.

[29] (18,380 units in SCAQMD jurisdiction) / (47,629 total units in California) = 38.6%

Table 3: SCAQMD Annual Project VOC Emissions (lbs/year)

Type of Pipe	2½ Bath Units	1½ Bath Units	Average Unit
PVC	42,183	30,385	36,284
ABS	26,881	19,363	23,122
70% PVC / 30% ABS	37,592	27,078	32,335
50% PVC / 50% ABS	34,532	24,874	29,703
30% PVC / 70% ABS	31,472	22,670	27,071

IV.G State and SCAQMD Daily Project VOC Emissions

Construction does not occur 365 days per year. Construction would either not occur on holidays and weekends or would at least occur at a substantially reduced level. Further, plumbers typically only work 5 days per week. (Hall Letter, Paragraph 13; Calone Letter, Paragraphs 8, 9). Therefore, construction emission estimates typically assume 250 working days in a year, based on 5 days for 52 weeks minus 10 holidays. Accordingly, I have calculated daily emissions assuming a) 365 days of installation per year and b) a more realistic number of 250 working days per year. Table 4 and Table 5 summarize State daily project VOC emissions and Table 6 and Table 7 summarizes SCAQMD daily project VOC emissions for 365 working days and 250 working days, respectively.

Table 4: State Daily Project VOC Emissions (lbs/day)
(Installation 365 days per year)

Type of Pipe	2½ Bath Units	1½ Bath Units	Average Unit
PVC	299.5	215.7	257.6
ABS	190.8	137.5	164.2
70% PVC / 30% ABS	266.9	192.2	229.6
50% PVC / 50% ABS	245.2	176.6	210.9
30% PVC / 70% ABS	223.4	160.9	192.2

Table 5: State Daily Project VOC Emissions (lbs/day)
(Installation 250 days per year)

Type of Pipe	2 ½ bath units	1 ½ bath units	Average Unit
PVC	437.2	315.0	376.1
ABS	278.6	200.7	239.7
70% PVC / 30% ABS	389.7	280.7	335.2
50% PVC / 50% ABS	357.9	257.8	307.9
30% PVC / 70% ABS	326.2	235.0	280.6

Table 6: SCAQMD Daily Project VOC Emissions (lbs/day)
(Installation 365 days per year)

Type of Pipe	2 ½ bath units	1 ½ bath units	Average Unit
PVC	115.6	83.2	99.4
ABS	73.6	53.0	63.3
70% PVC / 30% ABS	103.0	74.2	88.6
50% PVC / 50% ABS	94.6	68.1	81.4
30% PVC / 70% ABS	86.2	62.1	74.2

Table 7: SCAQMD Daily Project VOC Emissions (lbs/day)
(Installation 250 days per year)

Type of Pipe	2 ½ bath units	1 ½ bath units	Average Unit
PVC	168.7	121.5	145.1
ABS	107.5	77.5	92.5
70% PVC / 30% ABS	150.4	108.3	129.3
50% PVC / 50% ABS	138.1	99.5	118.8
30% PVC / 70% ABS	125.9	90.7	108.3

V. Application of Thresholds of Significance

Applying the SCAQMD operational and construction thresholds of significance to the daily Project VOC emission estimates contained in Table 6 and Table 7 demonstrates that Project VOC emissions would have a significant impact under most of the scenarios provided. Project VOC emissions would violate the SCAQMD's operational threshold of significance of 55 pounds of VOC per day in all but one scenario. The SCAQMD's construction threshold of significance of 75 pounds of VOC emissions would be violated in 27 of the 30 scenarios.

These calculations demonstrate that the Project may result in a significant impact on air quality within the jurisdiction of SCAQMD. An EIR should be prepared to evaluate these impacts and to identify appropriate alternatives or mitigation measures. In addition, an EIR should investigate and disclose the Project's potential impact in other air basins throughout the state, as well as the Project's cumulative statewide impacts.

VI. Individual Building Development Construction Emissions Are Potentially Significant

The preceding section demonstrates that the Project's VOC emissions are significant when evaluated on a SCAQMD air district-wide basis.

Based on the amount of cement used per joint determined with the E-Z Weld Calculator, I estimated that between 1.7 pound and 2.3 pounds of VOCs would be emitted per day during the piping of each residential unit with PVC DWV pipe. (*See* Table 1.) A California licensed plumber indicates that 20 homes per day could be piped on the same day in a large residential development. (Hall Letter,[30] paragraph 2.) It is reasonable to assume that at least that many units could be piped per day in a single large multi-story residential building. The piping of these 20 units with PVC DWV pipe would therefore release between 33.1 lbs / day[31] and 45.9 lbs / day of VOCs.

These emissions (33.1 to 45.9 lbs / day), by themselves, exceed the operational significance thresholds of several air districts, including 5 lbs / day adopted by Ventura County, 10 lbs / day adopted by the San Luis Obispo County, and 25 lbs / day adopted by Butte, Colusa, Feather River, Northern Sierra, Santa Barbara, Shasta, Tehama County, and Ventura County Air Pollution Control Districts. The operational thresholds are used when a district has not adopted a construction threshold. (*See, e.g.*, El Dorado CEQA Guide[32]; SJVAPCD CEQA Levels[33].) None of the above districts have adopted specific construction emission thresholds. Thus, the VOC emissions from individual housing developments in these districts would be significant, regardless of whether the Project is considered as a construction or operational project.

The emission increase from a single building in this scenario does not individually exceed the construction significance thresholds adopted by El Dorado Air Pollution Control District (82 lbs / day), the SJVAPCD (55 lbs / day), and the SCAQMD (75 lbs / day). However, the emissions from a single large housing development are cumulatively significant. "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. **(**CEQA Guidelines, Section 15355(a).) "Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (CEQA Guidelines, Section 15355(b).) CARB, for example,

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[30] Letter from John Hall, Business Manager, UA Local 78, to Richard Drury, Adams Broadwell Joseph & Cardozo, Re: Issues Related to CPVC Plastic Pipe, April 7, 2005.

[31] 20 units / day × 1.7 lbs / unit = 33.1 lbs / day assuming 1½ baths per unit; 20 units / day × 2.3 lbs / unit = 45.9 lbs / day assuming 2½ baths per unit.

[32] El Dorado County Air Pollution Control District, CEQA Guide, First Edition, February 2002.

33 San Joaquin Valley Air Pollution Control District, CEQA Project Analysis Levels; www.valleyair.org / tranportation / ceqaanalysislevels.htm, accessed April 8, 2005.

concluded in a recent rulemaking that "Although each consumer product may seem to be a small source of emission, the cumulative use of these products by over 35 million Californians results in significant emissions." (CARB Initial Statement.[34])

The Project's individual unit construction emissions are cumulatively significant. Other construction activities occur when the 20 units are piped with DWV, including the piping of the potable water system, the use of diesel-fueled construction equipment and application of architectural coatings. These activities emit VOCs, which should be combined with PVC or ABS DWV emissions when estimating cumulative impacts.

VII. VOC Emissions on the Maximum Day Would Potentially Be Significantly Higher

VOC Emissions on worst-case days are likely to be significantly higher than calculated in Table 4 through Table 7. These calculations assume uniform conditions and construction throughout the year. However, the significance of a project under CEQA is generally based on the maximum emissions that can reasonably be anticipated over a given time period, typically a day or year, from all direct plus indirect sources. The SCAQMD, in its CEQA guidelines, for example, states: "In determining whether or not a project exceeds these thresholds, the project emission should be calculated in the same manner as that for the SCAB (*e.g.*, utilizing the highest daily emissions)." (SCAQMD Handbook, p. 6-3. *See* also SCAQMD Rule 1168, Attachment 1, p. 4.) Thus, EIR for this Project must evaluate the Project to disclose its likely worst-case emissions on any given day as discussed in the following comments.

VII.A Seasonal Variations

The peak construction period occurs during the summer and fall, when temperatures are mild to warm and rainfall is low. Construction slows down during the last quarter of the year and generally comes to a halt during the rainy season. Pipes cannot be joined in the rain using the cement welding process as water ruins the joint. Installation guides commonly note the importance of a dry surface. Therefore, it is reasonable to expect that more units would be built during the summer and fall than in the spring and winters.

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[34] CARB, Initial Statement of Reasons for Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measures for Para-dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products, Volume I: Executive Summary (2004).

This seasonal variation in construction would increase the number of units built per day, increasing maximum daily VOC emissions compared to the estimates contained in Table 4 through Table 7, which are based on annual averages. Licensed plumbers estimate that construction slows down by 20 to 30% during the rainy winter months. (Hall Letter, Parag. 12; Calone Letter, Parag. 7.) Thus, construction during the remaining nine months of the year would be approximately 10% higher than the average. This would result in an approximate 10% increase in daily emissions above the average values I calculated in Table 4 through Table 7. This factor must be considered in an EIR on the Project.

VII.B Over-application, Accidental Spills and Open Cans of Solvent

I estimated VOC emissions from vendor usage data. This data underestimates usage due to differences between controlled laboratory conditions and field conditions. (Hall Letter, paragraph 3; Calone Letter, paragraph 2). A certified plumbing inspector explains: "Plumbers almost always use more cement, primer and solvent than suggested by manufacturers when installing [plastic plumbing] pipe. This is because it is expedient (there is no bonus for saving and there is a large penalty for leaks)." (Calone Letter, Parag. 2.) The maximum day emissions should be based on worst-case conditions assuming this over-application. An adequate review of the Project's potential VOC emissions must consider how the usage of these solvents under actual field conditions may significantly increase the actual Project VOC emissions.

Vendors caution that their usage estimates are guides only and actual usage could be higher, depending upon application practices. For example, IPS Corporation, a leading manufacturer of plastic pipe primers and cements, warns that "[t]hese figures are estimates based on our laboratory tests. Due to the many variables in the field, these figures should be used as a general guide only." (IPS Weld-On Guide.) The *Thermoplastic Piping Technical Manual* cautions: "…The PVC and CPVC solvent cement usage estimates… should only be considered as guideline. Actual usage could vary according to a wide variety of installation conditions… these estimates should in no way be used to restrict the liberal instructions in the Six Step Application Techniques…"

There are a number of critical differences between laboratory and field application of primers and cements that could substantially increase field usage.

First, in the field, there is a large penalty for joint failure. Joints are not tested until the complete system is assembled and pressure tested. Once a system is assembled, it is very difficult to isolate leaks and very expensive to repair them, particularly if they occur after a unit is occupied. Further, it is well known that the most common cause of joint failures is failure to apply adequate amounts of cement.

(ElChem, pp. 5-6.) IPS estimates that 90% of joint failures are caused by insufficient coatings of cement. (IPS Weld-On Notice.[35]) Therefore, applicators routinely apply excess primer and cement to assure good seals because there is no penalty for excesses.

Second, plumbing codes, plumbing manuals, and vendors recommend applying "liberal" and "heavy" amounts.[36] These terms mean different things to different people and can result in substantial over applications. Further, due to ease of installation compared to copper pipe soldering, PVC and ABS are sometimes installed by less skilled labor, potentially resulting in more frequent incidence of improper workmanship and excessive application. (Builders Websource 2002.[37])

Third, high temperatures and winds can increase the amount of material required per joint.[38] The laboratory is a controlled environment with ideal joining conditions. The temperature is usually around 70°F. Field temperatures can range from subzero to 110°F in desert portions of California where most of the new residential construction is occurring. Pipes are often stored outdoors in the hot sun and assembled at elevated temperatures. Extreme ambient temperatures and other conditions (*e.g.*, winds, rain, snow) make it difficult to control application when it occurs in unprotected areas. Further, high temperatures and weather conditions, such as those that occur during the peak construction period throughout much of California where rapid growth is occurring (*e.g.*, Mojave Desert, Central Valley, South Coast), substantially increase losses from volatilization and hence usage per joint compared to lab conditions.

Fourth, in the field, there is always pressure to perform work quickly to minimize labor costs. Therefore, the time is virtually never taken to carefully replace the lids on the primer and cement cans between joints, as practiced in the lab and instructed on the cans. This increases the volatilization loss per joint. Field observations indicate that the cans are typically left half open, with the dauber off to

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[35] IPS Weld-On, Notice, Most Joint Failures Are Caused by "Dry Joints"!

[36] The Plastic Pipe and Fittings Association's Plumber's Installation Handbook recommends applying a "heavy" coat of cement. (Plastic Pipe and Fittings Association, Plumber's Installation Handbook, August 2003. http://www.ppfahome.org/pdf/PIH_Aug03.pdf, at p. 6.) Harrington's Engineering Handbook for Industrial Plastic Piping Systems recommends applying a "liberal coat of solvent cement." (*Ibid.* at p. 80.) Ace Hardware recommends: "[l]iberally apply cement first to the pipe end..." (ACE Hardware, Working with Plastic Pipe.)

[37] Builders Websource, CPVC vs. Copper Plumbing, Updated October 28, 2002. http://www.builderswebsource.com/techbriefs/cpvccopper.htm#Introduction.

[38] J. Phyllis Fox, Comments on Draft Addendum to Final Mitigated Negative Declaration Amending Section 604.1 of California Plumbing Code, April 22, 2005.

one side. More care is taken with the cement because solvent evaporation thickens the cement, but even in this case, the lid is virtually never screwed on.[39]

Fifth, accidental spills occur in the field that usually do not occur in the laboratory. An industrial hygiene survey found that in 14 out of 280 15-min exposure periods, or 5% of those monitored, small spills covering less than 3 square feet were observed. Some workers also applied primers and cements very liberally, sprinkling their clothes, the pipes, and nearby surfaces with drips and small splashes. (CDOHS 1989[40], p. 15.)

Finally, there is no limit on the quantity of adhesives that can be used per joint or per unit. Thus, more product than indicated in vendor usage estimates could be used.

All of these factors would increase the release of VOCs, compared to the vendor usage data that I relied on to calculate potential emissions in Comments IV.E through IV.G. Thus, Table 2 through Table 7 likely substantially understate the potential Project VOC emissions and the resulting significance of air quality impacts. An adequate EIR on this Project must consider all of these factors in determining the scope of air quality impacts associated with the Project.

VII.C Hot Windy Days Would Increase VOC Emissions

The solvents used to join PVC and ABS pipe are very volatile. The amount of VOCs that is emitted depends on weather conditions — the ambient temperature and wind speed at the job site.[41] The higher the temperature and wind velocity, the larger the amount of VOCs that are emitted. An adhesive vendor guide to solvent cementing explains:

> Solvent cements for plastic pipe contain high strength solvents which evaporate faster at elevated temperatures. This is especially true when there is a hot wind blowing. If the pipe is stored in direct sunlight, the pipe surface temperatures may be from 20 F to 30 F higher than the ambient temperature. (IPS Weld-On Guide, p. 13.).

A plastic pipe engineering manual contains an almost identical caution. (PPFA Handbook 2003, p. 83.) Another pipe vendor notes: “As the temperature

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[39] *Id*.

[40] California Department of Health Services, Plastic Pipe Installation: Potential Health Hazards for Workers, April 1989.

[41] J. Phyllis Fox, Comments on Draft Addendum to Final Mitigated Negative Declaration Amending Section 604.1 of California Plumbing Code, April 22, 2005.

and/or wind increase, the rate of solvent evaporation quickens." (Chemtrol Manual, p. 20.)

The higher the temperature and wind speed, the higher the amount of adhesive product evaporated and amount of VOC emitted. The highest ambient temperatures and winds occur during the peak construction period, May through November. VOC emissions would be much higher on a hot summer day than a cool winter or spring day, *e.g.*, more would evaporate from the container, brush, and coated surfaces. Further, weather conditions affect priming and cementing action, requiring repeated applications during severe conditions. (IPS Weld On Guide, p. 6). An adequate EIR on the Project must evaluate how variations in temperatures may affect worst-case VOC emissions.

VIII. VOC Emissions from Cleaners Must Be Calculated

The mating surface of PVC or ABS pipe may contain waxy chemicals that are slippery and provide a barrier to cementing.[42] These chemicals originate from extrusion aids and molding release agents used to manufacture the pipe. Mating surfaces must be free of dirt, dust, great, paint, water and other substances. If not removed, they "provide a serious jeopardy to the making of a successful joint." This may be done using a volatile solvent such as methyl ethyl ketone ("MEK") if deposits cannot be removed with a dry paper or cotton towel or rag. The solvents used to remove waxy, hydrocarbon-based contaminants are called cleaners. A cleaner is frequently used in addition to primer. E-Z Weld, a leading vendor of PVC joining chemicals, explains in a Technical Note that: "[p]ipe cleaner is a non-aggressive mix of solvents used to remove contamination from joints and pipes prior to cementing. It will remove inks, dirt, oils and grease that could affect joint quality – and will not carry them into the plastic – as would primer."[43] An adequate EIR on this Project must take into account VOC emissions from cleaners in its air quality analysis.

The E-Z Weld Calculator states that cleaners may increase the use of solvents by an additional 33%.[44] Accordingly, it is reasonable to assume that Project VOC emissions may actually be up to 33% higher than I calculated in Table 2 through Table 7.

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[42] J. Phyllis Fox, Comments on Draft Addendum to Final Mitigated Negative Declaration Amending Section 604.1 of California Plumbing Code, April 22, 2005.

[43] *Id*.

[44] E-Z Weld, E-Z Calc; http://members.aol.com/ezweld/ezcalc.html, accessed October 9, 2006.

IX. Indirect VOC Emissions from Manufacturing Must Be Evaluated

CEQA requires that both primary or direct and secondary or indirect consequences of a project be evaluated. (CEQA Guidelines, Section 15064(d).) The Project will increase the demand for PVC and ABS pipe, fittings, and joining chemicals. It is reasonable to assume that a portion of this increase in demand will be met by existing California manufacturers. The VOC emissions originate from storing and blending solvents in tanks, mixers, and dispensers. Some of the solvents used in these processes may also be manufactured in California, further increasing indirect emissions.[45] This would increase VOC emissions from these existing manufacturing facilities, increasing the Project's adverse impacts on air quality. Given the magnitude of the increase in PVC and ABS use proposed by the Project, it is reasonably to assume that the increased VOCs from existing manufacturing facilities in California may be individually and cumulatively significant. An adequate EIR on this Project must include an evaluation of indirect emissions from manufacturing in its air quality analysis.

X. The Increase in VOC Emissions Would Contribute To Violations of Ozone Ambient Air Quality Standards throughout the State

Ozone is a regional pollutant and is the most pervasive of all the regulated criteria air pollutants. It is not emitted directly into the air. Instead, it results from complex chemical reactions in the atmosphere between VOCs and NOx in the presence of sunlight. VOCs emitted in one area may not result in significant impacts in that area, but yet can cause or contribute to ozone impacts in adjacent areas. Thus, ozone and its precursors, VOCs and NOx, must be evaluated on both a local, project-level basis, regional, and cumulative basis. It is not reasonable to conclude that small VOC emissions in one region are not significant without considering their cumulative effect on nearby regions.

An understanding of the nature of ozone pollution is important to understand why it is important to do evaluate the significance of ozone emissions on a statewide, district-wide, and cumulative basis. Ozone, the principal element of smog, is a secondary pollutant produced when two precursor air pollutants — volatile VOCs and NOx — react in sunlight. (*American Petroleum Institute v. Costle*, 665 F.2d 1176, 1181 (D.C. Cir. 1981).) VOCs and NOx are emitted by a variety of sources, including cars, trucks, industrial facilities, petroleum-based solvents, and diesel engines.

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[45] *See* J. Phyllis Fox, Comments on Draft Addendum to Final Mitigated Negative Declaration Amending Section 604.1 of California Plumbing Code, April 22, 2005.

The human health and associated societal costs from ozone pollution are extreme. In proposing a new rulemaking limiting emissions of NOx and particulate matter from certain diesel engines, EPA summarized the effects of ozone on public health:

> "A large body of evidence shows that ozone can cause harmful respiratory effects, including chest pain, coughing and shortness of breath, which affect people with compromised respiratory systems most severely. When inhaled, ozone can cause acute respiratory problems; aggravate asthma; cause significant temporary decreases in lung function of 15 to over 20 percent in some healthy adults; cause inflammation of lung tissue, produce changes in lung tissue and structure; may increase hospital admissions and emergency room visits; and impair the body's immune system defenses, making people more susceptible to respiratory illnesses." (66 Fed. Reg. 5002, 5012 (Jan. 18, 2001).)

Similarly, CARB concluded in a recent rule making to reduce VOC emissions from similar products:

> "While we cannot accurately assess potential risk reduction due to reducing VOC and PM emission, it has long been known that exposure to ground level ozone and PM have adverse impacts on public health. Research has shown that, when inhaled, ozone and PM can cause respiratory problems, aggravate asthma, and impair the immune system. Any reduction in PM or ozone precursors, namely VOCs, results in improving health in California." (CARB Initial Statement, p. 24.)

Moreover, ozone is not an equal opportunity pollutant, striking hardest the most vulnerable segments of our population: children, the elderly, and people with respiratory ailments. (*Id.*) Children are at greater risk because their lung capacity is still developing, because they spend significantly more time outdoors than adults — especially in the summertime when ozone levels are the highest and most of the construction activity occurs, and because they are generally engaged in relatively intense physical activity that causes them to breathe more ozone pollution. (*Id.*)

Ozone has severe impacts on millions of Americans with asthma. While it is as yet unclear whether smog actually causes asthma, there is no doubt that it exacerbates the condition. (*See* 66 Fed. Reg. 5002, 5012 (Jan. 18, 2001) (EPA points to "strong and convincing evidence that exposure to ozone is associated with exacerbation of asthma-related symptoms").) Moreover, as EPA observes, the impacts of ozone on "asthmatics are of special concern particularly in light of the growing asthma problem in the United States and the increased rates of asthma-

related mortality and hospitalizations, especially in children in general and black children in particular." (62 Fed. Reg. At 38864.) In fact:

> "[A]sthma is one of the most common and costly diseases in the United States. . . . Today, more than 5 percent of the US population has asthma [and] [o]n average *15 people died every day* from asthma in 1995. . .. In 1998, the cost of asthma to the U.S. economy was estimated to be $11.3 billion, with hospitalizations accounting for the largest single portion of the costs." (66 Fed. Reg. at 5012.)

The health and societal costs of asthma are wreaking havoc in California. There are currently 2.2 million Californians suffering from asthma. (CDOHS Asthma.[46]) In 1997 alone, nearly 56,413 residents, including 16,705 children, required hospitalization because their asthma attacks were so severe. Shockingly, asthma is now the leading cause of hospital admissions of young children in California. *Id.* at p. 1. Combined with very real human suffering is the huge financial drain of asthma hospitalizations on the State's health care system. The most recent data indicate that the statewide financial cost of these hospitalizations was nearly $350,000,000, with nearly a third of the bill paid by the State Medi-Cal program. (*Id.* at 4.)

XI. Air Quality Impacts from Concurrent Proposal to Expand Approved Use of CPVC Potable Water Pipe Must Be Examined in Conjunction with the Project

The Project's air quality impacts are further understated because it has not been evaluated in conjunction with HCD's proposed expanded approval of CPVC plastic drinking water pipe. HCD has proposed adoption of regulations that would modify CPC Section 604.1 to permit statewide unconditional use of CPVC plumbing pipe as an alternate material for hot and cold potable water distribution systems within residential structures. HCD prepared a Draft EIR, dated July 2006, to evaluate the environmental impact of this proposed expanded approval of CPVC[47] ("CPVC Draft EIR"). The Draft EIR, however, fails to disclose or evaluate HCD's concurrent proposal to expand the approval of PVC and ABS DWV pipe. HCD's failure to examine the proposed approval of PVC and ABS potable water pipe in its recent CPVC Draft EIR improperly piecemeals these projects.

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[46] California Department of Health Services, California County Asthma Hospitalization Chart Book, August 1, 2000.

[47] California Department of Housing and Community Development, Draft Environmental Impact Report, Adoption of Regulations Permitting Statewide Residential Use of Chlorinated Polyvinylchloride ("CPVC") Plastic Plumbing Pipe Without First Making a Finding of Potential Premature Metallic Pipe Failure Due to Local Water or Soil Conditions, July 2006, SCH #2006012044.

The CPVC Draft EIR concludes that the proposed regulations allowing the unrestricted statewide use of CPVC would result in significant and unavoidable adverse impacts on air quality, both individually and cumulative. On September 12, 2006, I submitted comments to HCD demonstrating that the proposed CPVC regulations would likely result in unavoidable adverse impacts on air quality and concluding that the impacts would be even more significant than revealed in the CPVC Draft EIR.

The proposed unrestricted approval of PVC and ABS DWV pipe and the proposed unrestricted approval of CPVC potable water pipe are sufficiently connected and related that their impacts must be examined together, rather than in separate documents. The unrestricted approval of PVC and ABS DWV pipe is proposed in the same regulatory package as the proposed unrestricted approval of CPVC potable water pipe. Furthermore, the proposed regulations would allow both PVC or ABS DWV pipe and CPVC potable water pipe to be installed in the same buildings at the same time. Finally, CPVC, PVC and ABS all use similar chemical solvents as joining agents and thus all contribute VOC emissions.

HCD's failure to evaluate the proposed unrestricted approval of PVC and ABS DWV pipe as part of its July 2006 CPVC Draft EIR on CPVC improperly piecemeals these related projects. Because HCD has already determined that the proposed expanded approval of CPVC may have a significant impact on air quality due to its contribution to VOC emissions, the additional VOC emissions associated with the proposed expanded approval of PVC and ABS DWV pipe would, *per se*, also be significant.

An adequate EIR for this Project must examine the potential air quality impacts from both of these proposed regulations.

XII. Cumulative Impacts Are Also Significant

The Project's cumulative impacts are also significant and must be addressed in an adequate EIR. Cumulative impacts result from individually minor but collectively significant projects taking place over a period of time. Because of this potential additive effect, "the full environmental impact of a proposed project cannot be gauged in a vacuum."[48] For these reasons, CEQA requires that an EIR

[48] Communities for a Better Environment v. California Resources Agency (2002) 103 Cal.App.4th 98, 114, fns. omitted.

discuss a project's potential cumulative impacts when combined with past, present, and reasonably anticipated future projects.[49]

In particular, the Project must be looked at in context with the current approval of PVC and ABS DWV pipe in buildings two stories or less. The installation of PVC and ABS DWV pipe in these buildings also results in the release of VOCs and the formation of ozone. By expanding the universe of buildings that may install PVC and ABS DWV pipe, the Project is cumulatively increasing the amount of PVC and ABS solvent installed in California on a daily basis. An adequate EIR must evaluate this cumulative impact and identify appropriate alternatives or mitigation measures.

[49] Pub. Resources Code § 21083, subd. (b), CEQA Guidelines §§ 15130, subd. (b) & 15355, subd. (b).

Exhibit 1:
Judy Yee, California Air Resources Board, Email to Robin Gilb,
California Department of Housing and Community Development,
Re: Thresholds of Significance for VOC Impacts, May 11, 2006

Exhibit 2:
Declaration of Casey J. Sondgeroth, October 18, 2006

Exhibit 3:
Plumbing schematics
provided by Plumbers & Steamfitters Union Local 159

Exhibit 4:
Calculations from E-Z Weld Calculator